



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/508,885	09/23/2004	Tatsukazu Kimura	CU-3914 RJS	8117
<div>26530 7590 01/09/2008</div> <div>LADAS & PARRY LLP</div> <div>224 SOUTH MICHIGAN AVENUE</div> <div>SUITE 1600</div> <div>CHICAGO, IL 60604</div>				
			EXAMINER	
			MAKI, STEVEN D	
			ART UNIT	PAPER NUMBER
			1791	
			MAIL DATE	DELIVERY MODE
			01/09/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/508,885

Applicant(s)

KIMURA ET AL.

Examiner

Steven D. Maki

Art Unit

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 December 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 5-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____.

1) A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 12-5-07 has been entered.

2) The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference characters "22" and "24" have both been used to designate the spreader roll. Also, reference characters "22" and "24" have both been used to designate the lump removing roller. In figure 2, it is suggested to change "22" (both occurrences) to --24-- and to change "24" (both occurrences) to --22--. Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

3) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4) **Claims 5-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Japan 808 (JP 08-112808) in view of Sucech et al (US 5,683,635), Hauber et al (US 6,878,321), Birdsey (US 1,514,827) and Ferguson (US 5,799,458).**

Japan 808 discloses making a plasterboard (gypsum board / drywall panel) comprising forming a slurry by mixing water, calcined gypsum, and additives using a mixer 120, supplying high density gypsum slurry 130 from the mixer 120, depositing the high density gypsum slurry 130 flowing through duct 140 on a lower paper sheet 110, using a **spreader roll 14 to form a spread portion and non-spread portions** on the lower paper sheet 110, supplying low density gypsum slurry 200 from the mixer 120, depositing the low density gypsum slurry flowing through duct 190 on the deposited high density slurry 130, supplying a high density slurry 130 flowing through duct 150 from the mixer 120, depositing the high density slurry 130 on the upper sheet 160, forming a layered structure of the upper sheet - gypsum slurry - lower paper sheet, rough cutting the layered product, hardening the gypsum slurry, cutting the rough cut product to a predetermined product length board and drying the board. Japan 808 teaches that use of a high density slurry for the edges prevents dryout and loss of strength of the edges. See figure 1, figure 2, abstract and machine translation. During a partial oral translation of claim 13 and part of paragraph 15 of Japan 808 by a USPTO translator, the following information was obtained. In claim 13, Japan 808 describes: "Method for molding gypsum board according to claim 12 including the fact that before a laminated body is

formed, both of the edges of the lower paper are folded upward along the longitudinal direction and a dam part of mud is formed from the non extended part." In paragraph 15, Japan 808 describes: "The length of the application roller 14 is smaller than the width of the original paper and between the edges of the application roller 14 and original paper A, a non-extended part 20 not shown in the drawing is formed. The width of the non extended part 20 is generally preferred to be from 10 mm to 50 mm. Therefore, the mud which is extended in the width direction of the original paper A by the extension part 20 passes along the non extended part 20 and is inserted from the two ends of the application roller 14. It is possible to flow on the respective edges of original paper A (edges of the folded gypsum board) from both ends of the thin layer. When original paper A is used as upper paper of the gypsum board, it is not necessary to provide the non extended part 20, but both ends of the thin layer must be glued and the width of the roller or the non extended part 20 must be the width excluding the glued part."

Japan 808 is silent as to the specific construction of mixer 120 for supplying the high density gypsum slurries and low density gypsum slurry.

As to claim 5, it would have been obvious to one of ordinary skill in the art to provide Japan 808's mixer 120 as a **disk-type rotary mixer** having at least one fractionation port provided on a peripheral area of the disk-type rotary mixer and a delivery pipe provided on the peripheral area of the disk-type rotary mixer wherein an inlet for foam is set on the delivery pipe; extract high density gypsum slurries 130, 130 for application to the upper sheet 160 and lower paper sheet 110 from the at least one

fractionation port; introduce the remainder of the slurry into the delivery pipe; pour foam into the delivery pipe through the inlet for foam to form the low density gypsum slurry and deposit the low density gypsum slurry as the core slurry 200 since (1) Japan 808, directed to making gypsum boards, suggests providing mixer 120 as a *single mixer* for supplying the high density slurries and the low density slurry (paragraph 20 of machine translation), (2) Sucech et al, directed to making gypsum boards, teaches providing a mixer comprising a *single mixing chamber* 10, rotating disc 54, auxiliary outlet 44 (fractionation port) for extracting "higher density" gypsum slurries, conduit 42 (delivery pipe) and foam inlet 32 for forming a foamed "lower density" gypsum core slurry so that a lightweight board can be formed and efficiency of foaming agent is improved and (3) Hauber et al, directed to making gypsum boards, suggests supplying first gypsum slurry and third gypsum slurry to facing and backing sheets and supplying a second gypsum slurry as a core slurry using a disk-type rotary mixer 30, separate controllers 36, 46, 136 and outlets 34, 48, 134 ("delivery pipes") so that, in addition to using *one mixer* to provide all three streams, additives (e.g. foaming material for the core gypsum slurry 44) can be added to each stream as desired (figure 1, col. 6 lines 19-53, col. 8 lines 44-57, col. 11 lines 10-55). Although Hauber et al teaches using glass fiber mats for the sheets, Hauber et al teaches that paper may be used. See col. 5 lines 53-65.

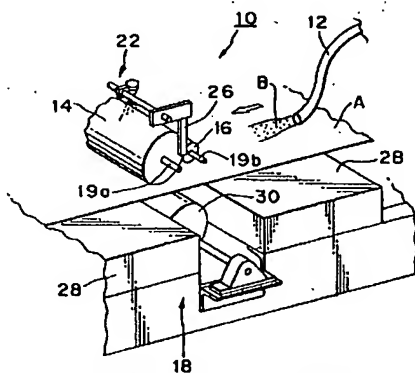
The formation of a lightweight foamed gypsum core per the teachings of Sucech et al and Hauber et al would have been desired by Japan 808 since Japan 808 teaches using a low density gypsum slurry for the core whereas high density gypsum slurry is used for coating the upper and lower paper sheets. Motivated by the desire found in

Japan 808 to use one mixer 120 to supply three gypsum streams, one of ordinary skill would have found it obvious to employ a disc type mixer as described by Sucech et al and Hauber et al for such purpose. Motivated by the desire found in Japan 808 to use a low density core gypsum slurry, one of ordinary skill in the art would have found it obvious to add foam to the gypsum slurry for the core as described by Sucech et al and Hauber et al to obtain the desired low density.

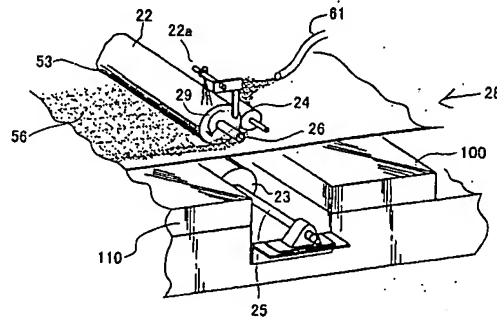
Japan 808 teaches folding the edges of the lower sheet upward and applying an upper sheet, but does not appear to recite adhering the upper sheet to a margin of the lower paper sheet.

As to claim 5, it would have been obvious to one of ordinary skill in the art to use Japan 808's plasterboard manufacturing method such that sheets 110, 160 are paper sheets, the lower paper sheet 110 is **folded** and the upper paper sheet 160 is adhered to a margin of the lower paper sheet since (1) Japan 808 teaches upwardly folding the edges of the lower paper sheet upon which gypsum slurry has been deposited and applying an upper sheet and (2) Birdsey, directed to making wallboards, suggests upwardly folding the edges of a face paper sheet upon which a gypsum slurry has been deposited and applying and adhering a backing paper sheet to margins of the face paper so that the gypsum slurry is confined and the paper sheets are maintained together (page 1 lines 97-110, figures 6-9). Birdsey evidences the customary practice in the plasterboard art to overlap the edges of the paper sheets and adhere the overlapping edges together (page 1 lines 97-110, figures 6-9).

With respect to the length of the spreader roll, the claimed spreading roll corresponds to Japan 808's spreading roll 14. Figure 1 of Japan 808 and figure 3 of this application are provided below:



JAPAN 808



APPLICANT

As can be seen from the above figures, Japan 808's spreading roll 14 is substantially the same as applicant's spreading roll 22. As can also be seen from the above figures, both of Japan 808's spreading roll 14 and applicant's spreading roll 22 have a length less than the width of the paper sheet. In Japan 808, the width W of the board is less than the width X of the paper sheet because both edges of the paper sheet are folded upward along the longitudinal direction and the width between the fold lines defines the width W of the board. In other words:

$$X \text{ (width paper)} > W \text{ (width board)} = \text{distance between fold lines}$$

With respect to the width of the board being equal to the distance between boundary lines of the front and side surface, see applicant's definition at page 25 of the specification. In Japan 808, the spreading roll 14 has a length L less than the width X of the paper sheet. In other words:

$$X \text{ (width paper)} > L \text{ (length spreading roll)}$$

Japan 808 teaches that the spreading roller 14 is used to form a spread part on the lower paper sheet. Japan 808 teaches that a non-spread part is formed on the lower paper sheet at each end of the spreading roll 14. Japan 808 teaches that the non-spread part has a preferred width of 10 mm to 50 mm. In other words:

$$\text{width } Y \text{ (each non-spread part)} = 10 \text{ mm to } 50 \text{ mm (0.39 inch to 1.97 inch)}$$

Japan 808 does not recite a specific width of the gypsum board (drywall panel).

However, it would have been obvious to one of ordinary skill in the art to make Japan 808's plaster board (drywall) such that it has a standard width of for example four feet (48 inches) since drywall panels are typically produced in lengths up to 16 feet and standard widths of 48 inches and 54 inches as evidenced by Ferguson (col. 1 lines 13-15). If the distance between the end of the spreading roll 14 and the fold line is equal to the width of the non-spread portion, then the length L of the spreading roll 14 is:

$$\text{width } W \text{ (board)} = \text{width } Y \text{ (non-spread)} + \text{length } L \text{ (roll)} + \text{width } Y \text{ (non-spread)}$$

$$\text{length } L \text{ (roll)} = \text{width } W \text{ (board)} - (\text{width } Y \text{ (non-spread)} + \text{width } Y \text{ (non spread)})$$

When the width Y of the non-spread portion is 10 mm and the width W of the plaster board is the standard width of four feet (48 inches), the length L of the spreading roll 14 is 98.3% of the width W of the plaster board as demonstrated below:

$$W = Y + L + Y$$

$$4 \text{ feet} = 10 \text{ mm} + L + 10 \text{ mm}$$

$$4 \text{ feet} = (10 \text{ mm} + 10 \text{ mm}) + L$$

$$L = 4 \text{ feet} - (10 \text{ mm} + 10 \text{ mm})$$

$$L = 4 \text{ feet} - 20 \text{ mm}$$

$$L = 48 \text{ inches} - 0.79 \text{ inches}$$

$$L = 47.2 \text{ inches}$$

⇓

$$L / W = 47.2 \text{ inches} / 48 \text{ inches}$$

$$L / W = 0.983$$

⇓

$$L = 98.3\% W$$

The length L of 98.3% falls within the claimed range of 98% to 108%. If the non-spread portion extends beyond the fold line, then only a fraction of the 10 mm range falls within the zone defined between the end of the roll and the fold line such that the length L is greater than 98.3% and thereby falls further within the claimed range of 98% to 108%. In view of Japan 808's teaching to make gypsum slurry flow on the edges of the paper sheet A, upwardly fold the edges of the lower paper and obtain a plaster board having high density edges, one of ordinary skill in the art would readily understand that the gypsum slurry flows to or beyond the location at which the lower paper is folded upwardly. This conclusion is supported by the following statements of Japan 808: (1) "Furthermore, achievement of the increase in specific gravity of the edge of plaster board and a edge field is attained by passing the slurry of high specific gravity in the non-spread section of spreading roll both ends" (paragraph 9 of machine translation, emphasis added); (2) "... both of the edges of the lower paper are folded upward along the longitudinal direction and a dam part of mud is formed from the non-extended part." (claim 13, partial oral translation, emphasis added); (3) "It is possible to flow on the

respective edges of original paper A (edges of the folded gypsum board) from both ends of the thin layer." (paragraph 15, partial oral translation), (4) "... JP 808 discloses slurry extending in the directions of the width of the paper sheet A on the spread portion 20 flowing out of both ends of the spreading roll 14 through the non-spread portion 20 and being able to flow into the respective edge portions of the paper sheet A (edge portions of a plaster board for which both sides thereof being folded) from both sides of a thin layer (paragraph 15) ..." (page 7 of response filed 12-5-07, emphasis added). Thus, it would have been obvious to one of ordinary skill in the art to provide Japan 808's spreader roller 14 with a **length of 98-108% (claim 5) or 99-108% (claim 13)** of the distance between boundary lines (fold lines) of the front surface and side surface such that the spread and non-spread portions are formed on the face paper in view of: (1) Japan 808's disclosure to make a plaster board (drywall panel) comprising a lower paper sheet using a spreading roller 14 having a length L less than the width X of the lower paper sheet to form a spread portion and non-spread portions wherein each non spread portion has a preferred width Y of 10-50 mm (0.39 inch to 1.97 inch), (2) Japan 808's teaching to fold both edges of the lower paper sheet upwardly along longitudinal lines (the width of the board being the distance between the fold lines), (3) Japan 808's teaching to flow the high density slurry such that the edge of the plasterboard having the folded lower paper has a high density and (4) Ferguson's disclosure that four feet (48 inches) and four and one half feet (54 inches) are standard widths for a drywall panel. It is emphasized that the width of 10-50 mm for the non-spread portions of the high density gypsum slurry is a relatively small width compared to the standard width of a

plaster board. For example, 10 mm is only 0.8% of the standard width of four feet for a plaster board ($10 \text{ mm} / \text{four feet} \times 100\% = 0.393 \text{ inch} / 48 \text{ inches} \times 100\% = 0.8\%$). The percentage is even smaller for a larger standard width (e.g. 0.7% for 54 inch width). The above obvious conclusion does not require a determination that the high density gypsum slurry extends fully to the edge of the paper sheet; the folding of the paper sheet causing "the edge of the paper sheet" to be different than "the edge of the board".

As to claim 6, Japan 808 teaches spreading gypsum slurry on a backing sheet using a spreader roll 14 of a roll coater 100.

As to claims 7 and 10, Japan 808 teaches a coating thickness of 100-500 microns (0.1 mm to 0.5 mm)

As to claims 8 and 11, Sucech et al teaches that materials such as accelerators, retarders, fillers, binders, etc. are often employed in slurries to prepare gypsum products and as such it would have been obvious at least one of those materials (e.g. retarder) along with the calcined gypsum and water in the rotary type mixer.

As to claims 9 and 12, it would have been obvious to add foam to the first and third streams for coating the sheets 110, 160 since Sucech et al suggests adding a *low concentration* of foam using inlets 34, 36 since completely unfoamed gypsum may be too hard.

As to claim 14, it would have been obvious to one of ordinary skill in the art to provide the non-spread portion with a width of "less than 10 mm" such as 9.99 mm since (1) Japan 808 teaches forming non-spread portions extending from the ends of the spreading roll for obtaining a plaster board having high density edges (for preventing

dryout) and (2) Japan 808's disclosure of the non-spread portion having a width of 10 mm to 50 mm is merely a preferred teaching. As explained by the Federal Circuit, "...our case law does not require that a particular combination must be the preferred, or most desirable, combination described in the prior art in order to provide motivation for the current invention." In re Fulton 73 USPQ2d 1141, 1146 (Fed. Cir. 2004).

Remarks

5) Applicant's arguments with respect to claims 5-14 have been considered but are moot in view of the new ground(s) of rejection.

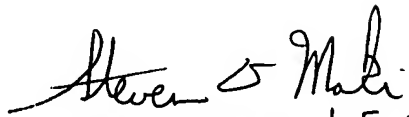
6) No claim is allowed.

7) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Steven D. Maki
January 4, 2008


STEVEN D. MAKI 1-5-08
PRIMARY EXAMINER